

Code No: G4305/R13

M. Tech. I Semester Supplementary Examinations, January-2017

POWER QUALITY

(Common to PE, P&ID, PE&ED, PE&D, EM&D and PE&PS)

Time: 3 hours

Max. Marks: 60

Answer any FIVE Questions
All Questions Carry Equal Marks

1. a What is the impact of transient on power quality? Classify the transients that occur in power systems. 6
- b Explain the short-duration voltage variations. Compare short-duration voltage variations with long-duration voltage variations. 6

2. a Explain the following in detail: 6
- a) Voltage Unbalance
- b) Waveform Distortion
- c) Voltage fluctuation
- b Define voltage sag and voltage interruption. What is their impact on equipments connected? Discuss the sources of sags and interruptions. 6

3. Discuss the following source of transient over voltages: 4x3
- a) Capacitor switching
- b) Magnification of capacitor-switching transients
- c) Lightning
- d) Ferro resonance.

4. a Describe how utilities can deal with problems related to capacitor-switching transients. 6
- b Discuss briefly about 6
- i. Utility System Lightning Protection
- ii. Load Switching Transient Problems.

5. a Explain about the controlling of harmonics using passive and active filters. How active filters overcome the drawbacks of passive filters in controlling of harmonics. 6
- b Explain briefly about the phenomena of current distortion and the voltage distortion under the presence of harmonics. 6

6. a Explain the following: 7
- i. Harmonic sources from commercial loads
- ii. Harmonic sources from industrial loads.
- b Explain the significance of harmonic index. Explain the general harmonic indices used universally in analyzing harmonic distortion. 5

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7. a What is meant by voltage flicker. List some sources of flicker. Discuss the methods for mitigation of flicker. 6
b Discuss how the capacitors are used for voltage regulation in power systems in shunt and series configuration. 6
8. a Discuss main power quality issues which affect distributed generation. 6
b Explain the solutions to wiring and grounding problems due to interconnection of DG to improve power quality. 6
